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ON

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DISORDER.

BY

JOHN GAY, F.R.C.S.,

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" On Varicose Disease " ( a Second Edition in the Press ) ;  
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## PREFACE.

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THE papers of which this little memoir is a revised reprint were recently published in the columns of the *Lancet*; and I should have sought no further means of making their contents known, had I not discovered, on further investigation, that some points needed restatement—more especially those that related to the hepatic system. Upon the consideration of these I entered somewhat reluctantly, for I felt that, according to conventional usage, this was a department of medicine that should not come within my special province. I, however, waived this objection, under the conviction that a surgeon who measures his aspirations by the scalpel is not fitted for the discharge of all his professional obligations, and that, on the other hand, *he* is best qualified for these who has most diligently cultivated, by the aid of anatomy, physiology, and pathology, the whole domain of medical science. Of these, I claim for anatomy the foremost place.

The true surgeon must ever be a physician, practised in an Art that belongs largely, though not exclusively, to his own craft. Manipulative skill is possessed in lesser or greater degree by all mankind, but it acquires a special dignity when refined by the knowledge of the physician and employed by him for the attainment of his ends. In illustration of this I need only refer to the example of Hippocrates and to his "Iatrium" or the "Physician's Establishment, or Surgery." The opinion that a surgeon must be a physician also is steadily gaining ground, and I have accordingly ventured to throw off the trammels of conventional surgery, by discussing hepatic disorder in relation to a disease with which it is alleged to be closely affianced.

The views here advanced may be altogether visionary, but they can have no influence for harm. Not designing this little publication as an "essay" or a "treatise,"—in neither of which it could hold a place with the monographs of, amongst others, Syme, Quain, Bushe, Copeland, Curling, Henry Smith (notably his admirable contribution to the last edition of "Holmes' Surgery"), and Allingham's practical treatise,\*—I have made but

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\* "On Diseases of the Rectum."

slight references to the works of these authors, and scarcely any to those of Duret, Richard, Bert, and Budin, since a becoming tribute to the general excellence of these contributions in surgery would have required a work far beyond my original plan.

J. G.

FINSBURY PAVEMENT,

*1882.*





# ON HÆMORRHOIDAL SWELLINGS, OR "PILES."

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## ERRATA.

*Page 2, line 3.—After "safest" add "guide."*

*Page 38, lines 6 to 11, should read thus:—"There are, indeed, substantial reasons why not only hepatic disease, but disease of any of the organs between the rectum and the heart, cannot be said to be specially conducive to the production of rectal hæmorrhoids."*

*Page 45, line 14.—For "Armamentum" read "Armamentarium."*

conclusions on such subjects can alone be based. The works of Fabricius ab Aquapendente, Vicq-d'Azyr, Walter, Loder, and their immediate followers, for instance, supply us with examples of the kind of information that is needed in order to a full comprehension of

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## ON HÆMORRHOIDAL SWELLINGS, OR "PILES."

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THE study of Hæmorrhoidal Swellings, or "Piles," cannot lead to any very satisfactory results unless based upon an exact and comprehensive knowledge of the venous system, not only as this relates to its general or *common*, but to its local or *special*, anatomy and physiology. Such a remark may be said to be so trite as scarcely to be called for; but the small amount of absolute fact, in comparison with conjecture, that pervades the general contributions to our literature on veins, and the diseases to which they are prone, calls for explanation; and I cannot but think that this is due to the scant sum of related knowledge that we possess of the premises upon which reliable conclusions on such subjects can alone be based. The works of Fabricius ab Aquapendente, Vicq - d'Azyr, Walter, Loder, and their immediate followers, for instance, supply us with examples of the kind of information that is needed in order to a full comprehension of



the mechanical physiology of the venous system; and, followed up in the spirit implied therein, the knowledge thus gained would be the safest <sup>guide</sup> to those labyrinths of complex fact wherein alone the anomalies of the venous circulation can find exposition. It seems, however, that with the labours of those distinguished anatomists, investigation in relation to vein anatomy began to be brought to a close, or at all events became relaxed; for the sum of their and cognate work has gradually settled down from the occupation of many pages quarto,\* to that of comparatively a very few in a moderate octavo, volume. But, as we have reason to know, efforts to advance *vein science* are being revived by earnest workers here and abroad—notably Herr Braune; so that ere long the study of this interesting branch will be acquitted of any shortcomings that might thus have been entailed upon it. Against this it might be averred that the study of the mechanism of the vein system has been superseded by that of its associated vital phenomena, and that out of this much good has come; still it cannot be gainsaid that a greater service would have been rendered to the interests of practical medicine had the two departments—the mechanical and the vital—been concurrently cultivated, as if with a deeper sense, than appears to have existed, of their mutual relationship and dependency.

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\* See e.g. *Loder's Tab. Anat.*

The phenomena concerned in the venous circulation, which are most apposite to the remarks that follow, may be summed up from the works of the highest authorities as follows:—

The flow of the blood through the veins presents strong contrasts with that in the arteries. In these—even in the smallest branches—there is a considerable mean pressure. In the veins—even in the small veins, where it is largest—the mean pressure is, on the contrary, very slight. The difference of pressure in the two tends to make the blood flow continuously from the arteries into the veins. The velocity of the stream in the *arteries* is therefore considerable, whilst in the *small* veins it is much less, and less in proportion than in the larger trunks; for in both arteries and veins it corresponds with the area of its bed, which diminishes, in the former from the heart to the capillaries, and increases in the latter from the capillaries to the heart. “The above phenomena are the results of an intermittent force, worked in a closed circuit of branching elastic tubes, so arranged that while the individual tubes first diminish from the heart to the capillaries, and then increase from the capillaries to the heart, the area of the bed first enlarges and then diminishes, the tubes together thus forming two cones placed base to base at the capillaries, with their apices converging to the heart. The peripheral resistance caused

by the friction on the capillaries and small arteries is an obstacle not only to the flow of blood through these vessels, where the resistance is actually generated, but also to the escape of the blood from the large into the *small*, and, indeed, from the heart into the *large* arteries. . . . The rapidity of the flow in the arteries, capillaries, and veins is in each case determined by the total sectional area of the channels.”\*

These remarks, which are of great importance, and based upon scrupulously well-ordered experiments, bear mainly upon the hydraulic principles and forces involved in the circulation; but there are associated points of detail which require more consideration than has been given them; such, for instance, as the physics of the vascular coats, and the contrasts these offer amongst themselves throughout the system; special anastomoses; the positions of the valves, their single as well as combined action and influence in effecting blood distribution, and thus, when in full and healthy play, in relieving the currents from a tendency to stagnate from otherwise hydraulic incompetency. To these points I shall casually return in the course of the following remarks.

The admission and study of these as qualifying factors in the circulating function might supply some of those elements that Dr. Foster complains of as “complications” in the vascu-

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\* Foster.



lar machinery, the absence of which renders certain problems connected with it very intricate, notwithstanding the light which experiment has thrown upon it; and perhaps, also, more intelligible the results of some of the best observations, which together would, if realised, help largely to augment the sum of our practical resources in remedying the diseases that appertain to it—notably, perhaps, those of the intra-cerebral circulation.

Thus I cannot avoid as an inference, from the study both of bodies and books, that the information the latter afford us on certain points referring to the vein system is not only comparatively meagre, but imperfect. Even its mappings are not strictly correct according to nature, and for that reason are not calculated to give a just notion of its mechanism and hydraulic properties; whilst the distinction between veins of rigidly fixed and those of ever-varying calibre, with the important relations which their contrasted physical properties hold to each other in a scheme for one common result, has not, I think, received its due meed of consideration.\*

Without such an amplification as I have referred to of the means of studying even the curious products known as

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\* The veins have been, I submit, studied anatomically too much after the manner of the arteries. In the veins the peripheral or, indeed, general distribution is a matter of little moment compared with a knowledge of their chief *inosculations*, and the laws that prevail over their valvular action; and to this knowledge retrograde injection is the principal key.

"piles," neither their *raison d'être* nor the anomalies of their clinique can be fully and satisfactorily explained. Thus, *e.g.*, portal congestion and allied hepatic affections have been held to be a constant source of disturbance to the currents in the hæmorrhoidal veins, and therefore in part accountable for the diseases that befall them; and anatomy has been charged with the explanation of the etiological relationship.\* But clinical observation shows that the cases of piles traceable to hepatic disease are comparatively very few; and in endeavouring to supply its place by adequate etiological antecedents—direct or indirect, functional or structural—the ground has come to be enlarged and, with it, the difficulty of profitably tracing them far in any direction. Even with regard to causation, the difficulties seem to be almost insuperable, for, as Mr. Allingham says, "piles happen equally to the robust and the healthy, to the rich and the poor, the active and the sedentary,"† and I may add, without fear of contradiction, to the young and the old, to the abstemious as to the indulgent, and I think to the healthy as to the diseased, for I have seen them repeatedly in persons below the age of twenty who have led unimpeachable lives, and are otherwise without a trace of disease—perhaps most frequently in

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\* To this subject I shall return somewhat in detail.

† On *Diseases of the Rectum*.

young married women ; still, I have seen them in young people of both sexes.

Gather together, if you will, the data of an extensive clinical inquiry, as I have done, and, as regards *remote or constitutional causes*, heritage will, I think, be found to take a considerable part in the rôle ; and as to *direct causes*, those modern usages of society which induce inaction in the lower bowels—sedentary habits, prolonged railway travelling, free indulgence in meat diet and highly alcoholic drinks, and that inattention to the calls of nature which busy lives are apt to regard as of little consequence, compared with the mart, the field, the tennis lawn, and the ball-room. These go far to constitute the list, so that modern customs have a tendency to exclude from use the means of counteracting the disordered actions and diseased tendencies which they are apt to engender, and may thus become justly credited with seemingly a large modern increase of this class of disorders. It may be taken as a rule of fairly general application that, as Mr. Quain remarks, sluggishness of the bowels aggravates, whilst their free action tends to relieve, hæmorrhoidal malady. At the same time the converse also sometimes holds abstractly good, for piles have been known to follow attacks of diarrhœa, especially if chronic, and due to morbid conditions of the lower bowel.

If we, however, take the relational anatomy of the



hæmorrhoidal veins, so far as it is known, the dilatation of their coats by portal obstruction is to some extent obvious, and certain forms of piles may find an explanation in that source—such, for instance, as that to which I shall allude as hæmorrhoidal varicosity; but of others—such as those limited dilatations which are usually known as common hæmorrhoids or piles—it cannot give so satisfactory an account.

The hæmorrhoidal veins, according to anatomical treatises, are said to form a portion of a vast pelvic plexus, or network, in the formation of which other veins—such as the uterine, the vaginal, the vesical, the prostatic, and the spermatic—take their respective shares. Together they constitute a congeries, and as it occupies the lowest and most dependent part of the trunk, and is destitute of valves, it would *à priori* seem impossible that there should be any disturbance in the larger branches or common trunks, causing reflux and peripheral blood-tension, that did not involve in its consequences, more or less and to a less or greater degree, the veins of the whole series; at all events, that any such disturbance should affect those of one series exclusively. And this would seem to be still more improbable should the cause of disturbance be in a part of either the portal or the systemic veins, so remote from the general periphery as more or less completely to cover that of the entire series. But this is not the case; for

instance, I have not met with an instance in which varicocele could be said to have been an etiological co-ordinate of piles, to whatever cause the latter may be traced; nor have I found any satisfactory evidence of the co-existence, with the worst forms of piles, of over-repletion of other locally associated but distinct vein systems. The hæmorrhoidal and the vaginal veins are often very largely distended at the same time through the pressure of large pelvic tumours, or the gravid uterus; but this fact does not contravene the principle for which I am contending, viz., that hæmorrhoidal veins may be, and usually are, amongst the pelvic series, exclusively dilated or varicose. After injury to these veins, as by operations, retention of urine, as everybody knows, is common, but it is clearly due to sympathetic and not to any physical consequences. And certainly the obstruction of the cava, below the confluence of the hepatic veins, does not produce piles; and, when met with in close contiguity to the heart, the pent-up streams seem to find compensatory outlet rather in hæmorrhage from mucous surfaces, varicosity of superficial trunk veins, or general œdema. But here I think our common anatomy is at fault, for although it states authoritatively that there are channels of intercommunication between the portal and the iliac veins, I have not been able to satisfy myself, as I shall presently endeavour to show, that any such inosculation exists. It is, moreover, alleged



by Bernand and Jacobson that a few *small* branches pass between the portal and renal veins. It might possibly be so, but of this also I have not been able to obtain any positive proof.\* So far, then, anatomy simplifies hæmorrhoidal disorder.

But what are "hæmorrhoids" or "piles"? Perhaps this question should have been answered before. I will, then, just state that "piles," or rather "hæmorrhoids" (which is the better term for my purpose), may be taken generically to include all forms of dilatation affecting hæmorrhoidal veins—especially such as are liable to become permanent by structural changes in their coats—and are, as I shall endeavour to show, in conformity with like tendencies in homologous veins in other parts of the body.

Mr. Hunter seems to have dwelt on these disorders with considerable interest, as is clear not only from the specimens he collected but from his comments upon them. In his MS. cases in Surgery he remarks that piles would appear to be principally increased or varicose veins. "They are, however," he continues, "disease, and in this respect differ from the plexus retiform of the cavernous bodies, to which they assimilate, but only in this respect." Here there is seemingly an intuitive perception of the real nature of pile tumours, for, in his collected specimens, Mr. Hunter has not exposed to view the veins on which the piles are situated in any case but one; and in that the muscular coat alone has

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\* See Schiff on Schwartz, Zeits Heilkunde, Bd. 1, 1862.

been stripped off (1277, H. Mus.); where any further exposure has been made, *as by section of the bowel or ulceration of the pile*, the hæmorrhoids themselves certainly do not generally exhibit that resemblance to the cavernous vascular tissue that Mr. Hunter speaks of; I have lately, however, had an opportunity of dissecting some pile tumours, and have found in one or two specimens a variety which has some resemblance to that, or rather to erectile, tissue. "The most singular thing," adds Mr. Hunter, "is the blood coagulating in them." Thrombosis is, indeed, a very frequent condition of hæmorrhoidally affected veins.

The specimens which illustrate this disease in the Museum of the College of Surgeons begin with number 1277, and are in continuity. They are well worth study.

The first I shall allude to is a specimen of Mr. Hunter's taken from a Bishop (Path. Cat. 1273), in which there is cancerous ulceration of the rectum from the anus, extending five inches up the bowels, and eating through into the bladder. There is a circle of piles around the anus, but no evidence of dilatation of the veins on which they are seated.

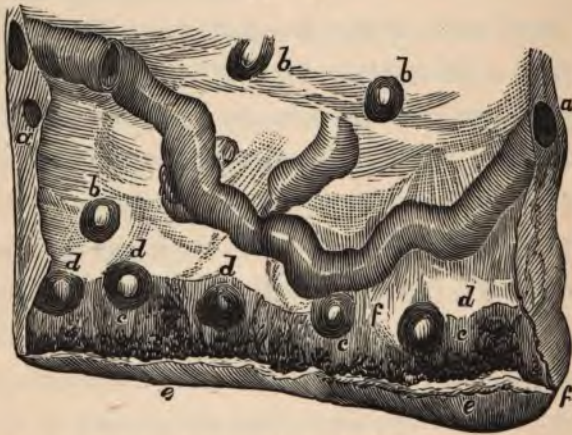
In Sp. 1277 ("A Pile," — Hunterian), the muscular structures have alone been taken away. It shows small varicose dilatations on the branches of the hæmorrhoidal veins, some of which have firm round clots of blood within them. The dilatation of the veins is so partial that "as the undilated portions by which they com-

municate are not all exposed, many of them appear like isolated sacs containing clots of blood." The appearance is clearly that of a cluster of small varices, irregularly distributed on otherwise undilated and small vein branches.

1278 represents a circle of hæmorrhoids that had been removed from the anal margin during life. They are extruded, and when cut off close to their roots the blood was found coagulated in the veins.—*Hunterian MSS.*

1279a shows a series of transverse sections of the rectum in order, from below upwards. The lowest of these sections shows a circle of piles just within the anal opening; the next sections—the second, third, and fourth—a few piles

FIG. 1.



*a a*, The cut edges of the bowel. *b b b*, Hæmorrhoidal tumours. *d d d*, A circlet of such tumours. *c f*, A fold or fringe of mucous membrane. *e e*, The nates.



only, but these take a like arrangement around the bowel, whilst the fifth and sixth have a single pile in each. The several segments are but thin, so that the whole of the pile swellings belong to the lower portion of the rectum, and these gradually lessen in point of number upwards. Around the piles the cellular tissue appears to have become thickened and hypertrophied.

In 1279 (see Fig. 1) there is a circle of swellings near the extremity of the rectum, with a few sparingly dotted about on the inner surface of its adjoining segment (*b b*). These do not extend above an inch or two in the upward direction, so that the circlet occupies its lower portion. Amongst these little swellings a large vein takes its somewhat tortuous course, apparently in a direction towards the higher parts, away from that of the anal series, whilst a fringe or fold of mucous membrane (*c f*), that does not invest a vein, hangs loosely from the submucous textures just below the hæmorrhoidal circlet. As Mr. Hunter remarks of a similar specimen, "they (the pile swellings) stick out on the surface of the bowel like so many 'knobs,' whilst, in the interstices, the soft parts shrink in as intervening septa." Mr. Hunter attributes the mucous fold to "hæmorrhoidal enlargement of the subjacent veins." (These flaps of mucous membrane and skin do not, however, appear always to bear out this view of their origin.) The skin at the margin of the rectum is thrown into a similar fold.

1280 (*Hunterian*) shows two circles of hæmorrhoids; one—the smallest—is just above the other, which extends around the bowel at the lower margin of the sphincter, and is separated from it by a sulcus or groove.

1281, two rows of piles; one at the anal verge, with another just above it, and fringes and depressions intervening, “probably from old ulcerations.”—*Hunterian*.

1282, an anal margin surrounded by hæmorrhoids.

1283, a similar row of anal hæmorrhoids at its margin. The mucous membrane above is ulcerated.

In 1284 the coats of the rectum and anal tissues are thickened and consolidated with surrounding textures. In this case half of the anal margin is surmounted by large hæmorrhoids covered with thin and slightly excoriated skin. “The patient (Mr. Hunter observes) had continued diarrhoea.” The transverse section of the rectum, two inches from the anus, shows consolidation of the areolar tissue surrounding the hæmorrhoidally affected veins, and, as in other cases, general longitudinal plication of the coats of the bowel,—probably a normal condition.

1284*a* shows hæmorrhoidal tumours within and beyond the margin of the anus. The mucous membrane *between* and *upon* the hæmorrhoids is in parts ulcerated and ragged. Portions of the hæmorrhoidal veins are dilated and filled with *clot* where exposed by section.

1253 shows simple stricture of the rectum an inch above

the verge of the anus with a circlet of large piles extruding from it.

In 1256 a rectum is seen with several large hæmorrhoids on one side of the margin. The skin around is excoriated. Immediately above the anus the canal of the rectum is suddenly and irregularly contracted, and unnaturally dilated above. There is no apparent change in the mucous membrane.

Sp. 1257, similar to 1256, there was great difficulty of defæcation (see case—*H. MSS.*—of General Gage).

Sp. 1262, two large hæmorrhoids are seen at the margin of the anus, with a fistulous passage.

In 1381, there is inversion with protrusion—anal invagination—of three inches of the rectum. The exposed mucous membrane is ulcerated, and the margin of the anus is surrounded by piles, some large and peduncated—no signs of varicose veins.—*Liston.*

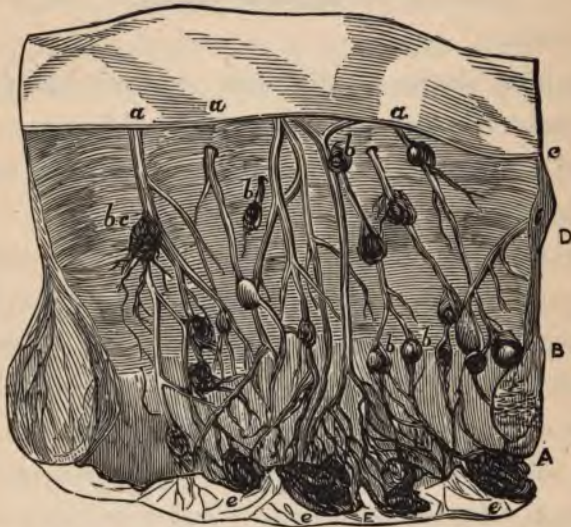
I will now describe appearances displayed by some attempts made by myself to inject and dissect the parts in which piles existed. I have not been able to gain many such opportunities. Some years ago I dissected some bulbous piles which surrounded the verge of the anus. Each pile was pendant (like the bulb of a thermometer on its stem) to a small vein which ran up the bowel, like those in Fig. 2, *bb, cc*; and which I could only trace by its extremely thready blood-clot. In this, as in other specimens, the



little pile sacs had here and there ulcerated, and exposed blood clot within.

In a case recently dissected (Col. Mus., 1278 *b*) the hæmorrhoids are in two tiers (Fig. 2, A B). The lowest, A, surrounds the extremity of the rectum, whilst the

FIG. 2.



Lower portion of hæmorrhoidal rectum laid open, with mucous membrane stripped off, and exhibiting circular muscular coat behind. The veins were filled with clot, so that injection ran into a few of them only. A, Anal piles, or varices. B, Rectal ditto. D, Edge of cut intestine. *a a a*, Vein branches, on which are *b b b*, pile tumours, some of which are ulcerated. *b c*, An erectile pile tumour. *e e*, Old varices obliterated.

second, B, is situated about level with the superior edge of the sphincter, and takes a like circular course. There

are a few (D) scattered piles in the rectum above. I endeavoured to inject them from a lower hæmorrhoidal branch, but without success, for, with one exception, the veins and their pile swellings—varices—were filled with old and tough clot. Those of the *upper* circle consist of small abrupt dilatations or pouches on small branches—continuations of those which took their rise at the verge of the anus, and on which the lower bulbous dilatations are situated. They are all imbedded in the submucous areolar tissue of the intestine, and have no other connection with its muscular coats.

Some of the larger swellings consist of “knobs” of closely compacted or convoluted small veins (Fig. 2, *b c*), also in a state of abrupt dilatation and thrombose; whilst most of the larger and advanced anal bulbs (*c c c*) are formed of loose corrugated and thickened skin enclosing encysted and condensed areolar tissue and clot, and are probably piles “burnt out.”\* Those of the anal series are largely fringed with corrugated folds of hypertrophied skin.

Through the kindness of a friend I have had an opportunity of examining another specimen of rectal hæmorrhoids (Fig. 3; Col. Mus., pn. 1278 B). The verge of the anus was in this case thickened into the form of a superficially serrated ridge surmounted by a considerable dermoid

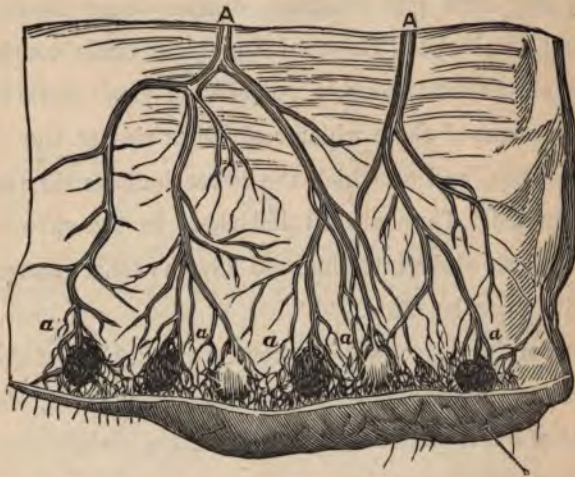
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\* Described by Dr. Bushe as “tissue conversion into a semi-cartilaginous and nearly bloodless mass.”



fold or fringe. Ulceration had laid open the cavities in several of these piles and disclosed blood-clots—firm in

FIG. 3.



Lower portion of hæmorrhoidal rectum, in which the veins, A A, were injected backwards. The cut edge runs across the bowel, which has been opened, and from which the mucous membrane has been stripped. The anal plexus is represented by the network between the skin and pile bulbs.

some, loose in others. The parts sent me included the bladder, prostate and vesiculæ seminales. With William Pearson's good help I first injected the prostatic branch of the internal *iliac* vein with *blue* wax. (See pn.) The injection ran *back* very freely into the veins of the plexus, and escaped from some few orifices, where the parts had been severed from their connections. I cannot affirm that

these were not branches of intercommunication with other veins. Some small tributaries of this plexus abutted upon the rectum, and inter-twined with a very few of its outermost longitudinal muscular fibres. Its veins filled rapidly but did not "bleed," neither did the injection pass into any of the branches of the hæmorrhoidal veins. *Red* injection was then forced into the mouth of a lower or internal\* hæmorrhoidal vein. It ran back into all its tributaries (Fig. 3, A A) to the minutest venules of the mucous and submucous tissues, even into the venæ venarum; and as it ran, so it expressed a quantity of ordinary slightly tinged mucus, but it did not pass into any, even the most approximate, of those of the prostatic plexus. There was therefore no *apparent* anastomosis between the veins of the two series. The injection ran also through their efferent veins into the empty bulbs, but did not finish its course here, for, filling the piles that were not thrombose, and escaping those that were, it found its way into a plexus or congeries of minute venules, which connected the initial portions of the afferent pile veins (Fig. 3, a a a) on the one hand with the skin on the other. This, which I venture to refer to as the *anal*,† in con-

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\* I take these terms to express the relation of the hæmorrhoidal trunk veins respectively, as *external* or *internal*, in relation to the muscular coats of the bowel.

† I have found this plexiform arrangement of the venules in this situation in other subjects.

tradistinction to the *hæmorrhoidal*, plexus, lay in a bed of fine areolar tissue which surrounded the extreme verge of the rectum, and which, with the plexus, could be traced upwards until both were gradually lost on the receptive branches at about a line even with the upper edge of the sphincter. This plexus is important, I think, in connection with hæmorrhoidal disorders; and, in this instance, its vessels showed to advantage, as they appeared to have undergone considerable dilatation. They, however, almost disappeared on attempts to clean them.

Thus each of these anal varices was a distinct bulbous dilatation on a hæmorrhoidal branch vein, which, as it formed and seemed to emerge out of the section of the *anal* plexus that locally corresponded with it, ran up the bowel, anastomosing with other veins of the series and free from disease.

The dilatation of the vein coats in each pile was abrupt, and each, with its multiform envelope, had moulded to itself a distinct skin or dermal pouch. The united capacity of the efferent veins was again apparently inadequate to the extradition of the blood sent to them by the afferent, in the event of its being in excess of its normal quantity. There was no dilatation of the veins or other abnormal conditions of any part of the bowel besides those described.

It is not shown that, as alleged by some writers, including



Dupuytren, Bushe and others, piles usually shew some evidence of their efferent veins having undergone constriction in their passage between the muscular fibres of the bowel. Whatever form the dilatation assumes—especially if it be the varicial,—it usually takes place at a distance from the part where such transit takes place; and as far as I have been able to carry my observation, the veins do not appear to suffer constriction thereby.

Mr. Quain has given some excellent illustrations in his work.\* In one, however, a bunch of pile swellings is seen protruding below the verge of the anus, whilst above the sphincter and *on the outer side of the muscular coats of the bowel*, dilated and somewhat tortuous veins are seen running upwards, as though they had passed between their fibres, and, by their action, had undergone dilatation.†

This, however, will not explain the varicial form, for all hæmorrhoidally disposed branches run between the mucous and muscular coats of the bowel—*i.e.*, they are entirely intra-muscular, and they worm their way through

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\* "On the Diseases of the Rectum."

† I have not been able to find an instance in which veins similarly related have shown symptoms of varicosity. Mr. Quain is, however, so scrupulously exact in the record of his observations, that I do not hesitate to admit the validity of the illustration, but I think the fact is of infrequent occurrence. Bushe certainly ascribes the dilatation in these cases to "contraction of the muscular coat of the bowel, which prevents the free ascent of the blood," but does not testify to any objective evidence in favour of this view.

the latter before they coalesce to form trunk veins. Anal hæmorrhoids are not, however, exempt from a liability to be pressed upon by the action of the sphincter, for, on extreme contraction, it must exercise some lateral pressure on their efferent veins, and might do so with such severity as fatally to strangle them. They do not pass through the sphincters.

The study of this case, sustained as it is in its pathological elements by those of other cases referred to, supplies a basis for some definite inferences as to the essential nature of hæmorrhoidal swellings. It seems, first, that they affect almost exclusively the branches of the lower hæmorrhoidal veins; and secondly, that they are limited to (*a*) segments of the vein coats, forming out of them either small bulgings or pouches of various shapes—fusiform, ampullary, clubbed, or pedunculated;—or (*b*) they are formed, in connection with the veins, of “knots” of closely packed and convoluted venules, resembling trabecular or erectile tissue; or (*c*) by dilatation of the coats extending throughout considerable and continuous portions of a vein, even entire branches.

Anatomically, the lower hæmorrhoidal veins take the blood from the skin, in the vicinity of the anal outlet, and from rectal mucous and related tissues. Their primary or capillary venules traverse the local connective tissue and form in its meshes what I have described as

the anal plexus (Fig. 3, *a a a*) ; whilst out of these, tributaries or branches emerge which lead consecutively to larger branches and, ultimately, to their trunks. These several sections (three in all) form the seats respectively of the forms by which I have endeavoured to distinguish hæmorrhoidal swellings ; viz.—

1. Anal or plexiform varicosity ;
2. Hæmorrhoidal varicosity—the varicose hæmorrhoidal vein ; and
3. Hæmorrhoidal varix—saccular or erectile,—the true “pile.”

They severally begin by attenuation of the affected portions of the vein coats through stretching, and the forms they assume become in the end permanent through the agency of organic changes which their tissues subsequently undergo.

Of these, the *first* is usually a more or less acute form of hæmorrhoid, and displays itself as a tense and well-defined welt or bluish cord at the extreme verge of the anal aperture. As it is usually associated with piles (of the *second* class), which are often embedded in its tissues, so the welt generally derives from them an uneven or serrated contour. An attack is painful, but not usually of long duration, and does not often, of itself, leave structural changes behind, beyond a mesh of enlarged venules, and seldom even this.



The swelling of the *second* variety occupies the larger hæmorrhoidal branches, and betrays itself in those large bloated veins which are often seen, in hæmorrhoidal persons, running up the rectum behind its mucous membrane. The coats of *varicose*\* hæmorrhoids do not as a rule undergo extreme morbid changes. After becoming rigidly dilatated and hypertrophied, they seem prone to various forms and degrees of inflammatory action—idiopathic, rheumatic, or pyæmic—which induce more or less widespread thrombosis, and ultimately those other, mainly atrophic, changes which veins so circumstanced ordinarily undergo. During life, in certain conditions of vascular excitement—especially during operations—such veins are apt to be misapprehended as they are observed running lazily, at times bloated and tense well-nigh to bursting. This form of varicosity is frequent in persons who are obese, and otherwise of lax fibre and gouty diathesis; but it is for the most part comparatively innocent, and often induced by pressure on pelvic trunks, in consequence of the special difficulties with which these veins have to contend from columnar pressure, and the comparatively feeble support their coats receive from surrounding tissues. Under ordinary normal conditions and with a little therapeutical or mechanical aid, such impediments

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\* I have endeavoured to distinguish between a *varicose* vein and *varicosity* of a vein. The former term I have used to denote a vein the coats of which have undergone morbid structural changes; the latter, simply dilatation with tortuosity.

are readily overcome, so that these attacks, too, are usually only transitory.

In *varix* the little sac, after attaining a certain size, gives way—bursts—and then shrivels up, or it may inflame and suppurate, and thus undergo a kind of spontaneous “cure;”\* or, again, it might become perforated by a kind of ragged or retiform ulcer.† Hæmorrhage generally follows, but this is usually checked by the formation of blood clots within. These might, however, be washed or melt away, and thus repeated acts of hæmorrhage occur until the sacs become permanently obliterated. Once more, their coats may become the seats of other acute or chronic disorder, accompanied by correlative forms of structural change and degeneration, to some of which reference will be made. In the specimens I have described as of my own dissection, as well as in others to which I have alluded, and from which the mucous membrane has been stripped,‡ I have not been able to find any instance or evidence of blood extravasation, although no reasonable doubt could be entertained that the piles had, in some, bled during life. It would appear that the process of perforation, where this

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\* “The pile,” says Montanus, “often becomes thus converted into a semi-cartilaginous and almost bloodless mass.”

† Dr. Bushe repeatedly injected anal piles, and observed the fluid to spurt out from the same pile in several minute streams.

‡ In Mr. Hunter’s specimens the mucous membrane has, I think, in no case been removed; in one, however, the outer surface of the muscular coat has been exposed, in order to show the vessels.



has occurred to a pile cyst, must, in its final steps, have been rapid, and probably completed by the formation of a superficial gangrenous eschar which, on separation, might give rise to profuse hæmorrhage such as that which sometimes suddenly overtakes hæmorrhoidal persons.\*

A *cluster* of varices often exhibits, of itself, many special varieties of swelling in point of general appearance as well as morbid change. Some will look—especially when not denuded of their mucous membrane—as though they were comparatively recent products, whilst others, from dissimilar resultant conditions, will offer proofs of longer terms of existence. Hence there is usually no ground for the inference that, because the coats of one pile have ulcerated, others of the same group have proceeded, or ever will proceed, to the like stage of degeneracy.

The tier upon tier, and, *in the lower tiers*, the circular, arrangement of varices is very common, and deserves notice—a disposition which is most frequently observed in the lower part of the rectum, where there may be two, three, or more such circlets in succession, with intervening sulci of healthy bowel. At the verge this is almost a constant arrangement, whereas, when met with higher up, the piles are fewer in number and irregularly scattered about. Those of a tier or circlet often

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\* Bushe mentions a case in which six lb. of blood was lost at once, and in a very short space of time.

differ in size, and of two or more tiers the sacs of the lowest are usually the largest and, in shape, most clubbed.\* The Mus. ps. 1279-80 show these points. In the former a pendant or flap of mucous membrane, in the latter a sulcus, separates two circlets.

The coats of *anal* varices, as well as of their efferent veins for a short distance, usually become fortified by sclerosis of the areolar tissue in which they are imbedded. Thus, as may be seen in certain museum specimens—notably in one (1278, A) contributed by Mr. Doran—in which a transverse section of the rectum has been made immediately above a cluster of anal piles—the exposed edges appear as though their structures had been corrugated or crimped up, and matted together into longitudinal folds, so as well-nigh to have closed up the intestinal tube in the region of the external sphincter; as well as in Pn. 1278, described p. 12. Notwithstanding this, the walls of the protruded pile bulbs, covered in part by skin and in part by mucous membrane, are far advanced in tenuity. *Rectal* piles differ from their *anal* allies in that their veins do not usually become thus consolidated with the areolar tissue in which they lie.

A division of hæmorrhoids has long been clinically admitted, into “external” and “internal.” The latter

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\* Bushe mentions a pile that was “as large as a peach stone, and deeply ulcerated.”

have been spoken of by most writers as much more serious products than the former. Mr. Syme described them as "very vascular growths, generally of a florid colour and uneven on the surface, like a strawberry."\* They are generally supposed to be developed from the mucous membrane and subjacent cellular tissue. I have not found any evidence in support of these views. On the other hand, they appear to be of the kind of tumours to which I have referred (p. 12),—a kind of telangiectasis or erectile tissue, situated, like varices, in the course of, and fed by, the ordinary veins (Fig. 3, *b c*).† They are usually met with *within* the rectum, and seem to follow in point of development much the same laws as allied growths elsewhere, though less prone to attain large proportions. Between the two there is no ground for this alleged practical distinction. They appear to be the "condylomata" of the early writers (Celsus and others).

Such, then, are the forms and some of the ways which, according to observation, piles assume in life, and present after death—forms of disorder in exact conformity with such as are habitual to veins of the superficial class in other parts of the body; but with these the points of similarity end.

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\* A resemblance recognised by Hippocrates.

† Dr. Bushe alludes to this form of pile as "spongy and made up of arteries and veins, the latter being most capacious, but still always healthy."



The intra-rectal ridges or folds of mucous membrane to which I have casually alluded are equivalents of those hypertrophied and warty-looking dermal appendages so often met with at the anal verge. Some run more or less directly or spirally up the bowel from the rectal extremity (see Fig. 1, *d d*), whilst others are loose and floating, and enclose or overlies large veins. They have uniformly the appearance of having been forced down by pressure from above.

I have referred to specimens (p. 14, &c.) in which ulceration, cancer, stricture, fistula and other diseases of the rectal structures have, severally or in groups, co-existed with hæmorrhoidal varices, especially those of the anal class, but neither in point of number, position, size, or in any other respect do they appear to have been in any way influenced thereby. The connection between them seems to have been that alone of coincidence and contiguity. There is, indeed, no direct pathological evidence in favour of the view that hæmorrhoidal varices are necessarily, either causatively or otherwise, associated with special vicinitous disease. They appear to be, as I have already more than hinted, strictly local diseases.

I cannot avoid the question—already *popularly* determined in its favour—how far is disturbance of the hepatic circulation, or structural change in the hepatic tissues, chargeable with hæmorrhoidal disorder or its aggravation?

Specimens in the Col. Museum, to which I have already casually referred, bear upon the latter point; viz., 1395, Hunterian; 1396, Paget; and 1400. In the last of these cases the liver has become severely cancerous, but most of the portal veins maintain their open mouths in the midst of dense and apparently encroaching tissue; others, however, *are* so far pressed upon that on transverse sections they take a star-like form, but their capacity is not thereby diminished. In Sp. 1401 (Sir A. Cooper) a liver is seen to be largely cancerous, but again the veins, which have been injected, exhibit no trace of having had their channels thereby interfered with. The same observation relates also to another specimen (1402, Sir A. Cooper); and in lardaceous livers the larger portal branches are rarely seen to lose their patency. Such diseases, then, do not seem to affect the larger blood streams through the liver, in the manner and to the extent generally attributed to them; so that jaundice has yet to be explained. Although I have sought, I have not succeeded in getting, opportunities of testing the results of injection in cirrhotic livers. It is possible that in such specimens certain veins would be found to have been obstructively compressed, or (it might be) obliterated, especially those which belong more especially to the circulation within or around the hepatic lobules.

To answer the question just put, I must digress, in order to state some propositions on a subject

to which I have already alluded, and in which I have been much interested; and which, if duly worked out, might, I think, not only unravel some of the intricacies in which the venous system is involved, but throw light also upon the nature of its special morbid tendencies.

I have maintained that some analogy exists between rectal hæmorrhoids and varicose disorders in the lower limbs. I have now to go further, and submit, as its basis, that, in the special anatomical arrangement of the vein system, uniformity exists throughout the animal economy; and that, as in the limbs so in the rectum and, indeed, throughout the whole body, that system is dual, consisting, *first*, of a deep axial, or, in relation to structures, a muscular set or system of veins, and *second*, of a collateral or compensatory system, which, in an analogous respect, is dermoid or mucous.\* Veins of the first order contribute the channels which convey the steadily flowing or main streams, whilst those of the latter carry the remoter—mainly the cutaneous—rills which help to feed them. The first are bound, by special aponeurotic structures, within certain limits as to capacity which they cannot easily exceed, and, like the arteries with which they are associated, are liable to comparatively little variation in their plans and respective courses; whilst the latter offer

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\* I might have used the term "parietal;" but it does not serve my purpose so well as the term adopted.



every variety in both respects, having almost unlimited means of accommodating themselves to contingencies, either by dilatation of their coats, modification of their routes, or, if needed, by a thousandfold and more multiplication of their vessels. The latter are typified by the saphenous, the former by the crural or femoral, vein ; whereas the mutual relations and interdependencies of the systems appertaining to each are everywhere alike. The *main* or *axial veins* are, in relation to the arteries, as a rule, comital and duplex, whilst the *dermoid* are *collateral* and *solitary*. Those of the former class have no outlet for the blood that has once reached them, but by an onward or centripetal flow, with but very little permissive reflux, whereas the veins of the latter allow a considerable extent of ebb and flow movement, and, by elaboration into a network of channels, will permit their blood (as it were) to ramble on and delay its final absorption by the axial streams, until these are in a condition to accommodate it—often running long distances for this end, even from the digital tips to the heart. It is by this arrangement that the risk of strained local blood-tension is averted, and uphill currents are enabled to make their way against apparently formidable obstacles to their destination.

I may here adduce a fact or two, in order to illustrate and confirm these views, from the domain of comparative anatomy.

In mammals, for the most part, certain axial or

*systemic* veins transmit the blood from the posterior segment of the body, chiefly from its muscular structures; whilst the blood from its corresponding dermoid textures passes into and through the azygoids, which, in some instances, it is said, receive a renal branch;—the azygoid system being the outcome of the *anterior cardinal*—a dermoid vein; whilst the *posterior cardinal* becomes the innominate—an axial or systemic vein. The portal should therefore be classed with the dermoid—compensatory or collateral system of veins. Like their congeners, as, in various forms and arrangements, its vessels pass through the liver for functional purposes, they not only derive help in their capillary departments, as their trans-pelvic quasi-homologues do, from ordinary sources, but other aid in futherance of their transmitting powers—*e.g.*, arterial impulse from the entire mesenteric system as well as contractile vein force in some parts, if needed; and, sometimes after birth, temporary or persistent communication with the cava through the ductus venosus or other large adventitious veins. Indeed, the freedom with which the hepatic currents flow through the several component textures of the liver is one of the marvels of the circulation. (See Appendix I.)

Thus, too, any unequal distribution of blood in the hepatic lobules from irregular hepatic or portal supply admits of adjustment, and tendencies to local hyperæmia or biliary



congestion are counteracted; whilst the products find a full and plenary discharge through their resultant cloacæ, the hepatic veins and biliary ducts. In some animals—the horse, turtle and others—the inner surface of the portal vein is reticulated, as though to retard a stream that might otherwise be too impetuous.

The observations just made bear on the question of direct hæmorrhoidal etiology by shewing that the vascular arrangements of the liver are such as can best promote free circulation and the maintenance of uniform blood tension throughout its tissues, and thus refute the commonly accepted doctrine that this is the most ill-regulated and soul-worrying organ in the body.

What it is able to do when in a morbid humour it is difficult to say; but to any one who will peruse Dr. Legg's able article\* on the artificial production of jaundice, it will become clear that it must be disordered action of a very severe and special type that can avail in setting up portal or hepatic *obstruction*, and such as will not fail of reflecting itself in extremely grave local, as well as systemic, disturbances. Even when icterus occurs it is rarely, if ever, allied with indications of concurrent disorder in the hæmorrhoidal vein system;† a conclusion that is in confor-

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\* St. Bartholomew's Hospital Reports, vol. ix.

† See Dr. George Harley's Memoir, in which the subject of jaundice is fully discussed.

mity with the introductory clinical observations as to its etiology and with Dr. Legg's experiments ; for these shew that it is only when ligature of the portal duct sets up inflammatory action along the tract of the areolar elements, of Glisson's capsule, that evidences of biliary extravasation betray themselves.\*

It is generally understood that the portal, have normal anastomotic connection with certain systemic, veins.† Since the publication of these papers in the *Lancet* I have made injections which appear, at least, to make this "ruling" questionable. I caused the portal trunk to be injected, in the peripheral direction, at the point of its entrance into the liver, both in the human subject and in lower mammals. The size ran into its extremest ramifications through the mucous and sub-mucous intestinal

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\* I omitted, in its proper place, to allude to Sir Astley Cooper's opinion that hæmorrhoidal swellings may be caused by the pressure of a fat-laden omentum or mesentery on the mesenteric veins as well as by difficulties in the transmission of the blood through the right side of the heart. It is a fair surmise that the former causes are equal to the production of these disorders, just as a large ovary or a gravid uterus might, in like manner, affect the iliac tributaries ; but there is no evidence, that I am aware of, of their having been caused by "chest affections."

† "The branches of the inferior hæmorrhoidal inosculate with the portal, and thus establish a communication with the general system. Other anastomoses exist between the gastric and the œsophageal veins which empty themselves into the azygos minor, and between the renal vein and the veins of the intestine, especially of the colon and duodenum."—*Gray's Anatomy, Holmes' 9th Edition.*

tissues and spleen, and was then made to run forwards through the liver. In its ex-hepatic course, it did not, by a single branch, communicate with the cava or with any of its *systemic* tributaries—not even the hæmorrhoidal.\* I then caused the inferior *cava* to be injected, in the same direction, *i.e.*, backwards, and again the injection failed to show any evidence of anastomosis on the part of its tributaries with portal branches. Moreover, on injecting the liver by the portal vein, it was noticeable that the injection did not make its appearance in the hepatic vein outlets or any of its larger intra-hepatic branches until it had traversed the *whole* of the inter-lobular capillaries. Hence the portal veins would appear to be normally the exclusive and direct way to the heart for their blood, mixed only with the special proceeds of their own intestinal absorption; whilst the blending of these products with the systemic vein blood does not appear to take place until they have been submitted to the functional activities of the hepatic cells.

But it might be asked, allowing the purely hydro-dynamic part of the argument, how is the physiological—that which relates to the compensatory offices of the intra-hepatic vein circulation—to be sustained? I think by the well established facts, that the portal veins and hepatic

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\* See Morgagni, *Let.*



arteries anastomose freely within the liver and, often, by means of plexuses; and that after jointly furnishing the capillaries of the connective tissue in which the portal canals, bile ducts, and other structures are embedded, they lead into special venules which accompany the arteries, in some parts in *couples* (*Atlas*, Klein and Noble Smith), ultimately to discharge themselves, by the inter-lobular rete, into the hepatic veins. It is here—in the inter-lobular rete—that the portal and hepatic vessels become mutually compensatory,\* and mainly through the accommodating properties of the portal series, for these have a privileged variable stream capacity and their streamlets derive special impulse from arterial sources. And not only so, but a conditional distribution of the blood is made to both portal and systemic veins at the outset, on their escape from their capillary venules.

There is then free course for the blood of the hæmorrhoidal veins, back to the heart from the establishment of an abundant compensatory, to the main, system, which can only very exceptionally be interfered with. It is, however,

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\* The vascular arrangement appears to be as follows :—The branches of the portal veins are in many places surrounded by those of the arteries, as by a plexus, and, before supplying capillaries to the connective tissue belonging to the portal canal and bile ducts, anastomose very freely with each other. It is the capillaries just referred to that lead into special veins which hold a comital relation to the hepatic arteries, *i.e.*, in being duplex.



possible that, from the portal as well as the renal system, disturbances to the *lower* hæmorrhoidal veins might accrue, without any such conditions as have been just referred to, though it is difficult to say how; but, in such cases, it usually results in cedema—a by no means infrequent condition of the submucous rectal tissues. There are, indeed, substantial grounds on which, not only hepatic disease, but disease of any of the organs of the trunk, interposed between the rectum and the heart, can be said to be specially conducive to the production of rectal hæmorrhoids. In other words, with all their seeming disadvantages, especially the want of valves, the hæmorrhoidal currents suffer as little, and perhaps less, resistance from objective interference, normal or other, to their course, as the vein currents of almost any other part of the body. (See Appendix I.)

It must be remembered, however, that the *rule* of vein inosculation is open to frequent exception. The isolation of the portal is, I believe, their normal relation to cognate veins; but abnormalities might readily and speedily occur by the formation of irregular inter-communicating branches. I have incidentally alluded to instances of this kind; others are well known; and should such exceptions effect the anastomotic relationship of large branches of important veins, such as, *e.g.*, the portal with the renal or azygoid, they would necessarily give rise to symptoms indicating some

special diversion of biliary or renal matter, for which, during life, it would be difficult to find a clue.

I cannot further here enlarge upon this interesting topic (see Appendix II.), but must proceed to some practical application of the foregoing remarks.

What, then, are the special circumstances which, in these veins, lead to and determine the several forms of varicose disorder by which they are so often beset? The pathological and other facts before us, without logically arranging them, render it, I think, obvious that they are due to forces which obstructively affect the hæmorrhoidal currents; and, tracing the process physically by the same light, it is clear that the first step is vascular and lies in local vein repletion—hyperæmia—from constitutional or physical causes, or both combined; whilst the second, in the absence of any proof to the contrary, is, in the same sense, extra-vascular, and can only be supplied by casual agencies, physical or physiological—usually conjoined,—such as are capable of directly acting upon the vein channels. The first of these collects on the capillary or ventricular, whilst the second is supplied on the opposite or auricular, side of the site on which the disease shews itself—the issue of the conflict being at those points in the vein coats where the resultant blood tension is in excess of their powers of endurance. The contour, size, &c., of the bulgings indicate the amount of force ex-

pended on their production, and show that it is much less than that concerned in the production of aneurismal swellings; whilst their situation and distribution—especially the tier upon tier arrangement (p. 22), one of their most characteristic features—show that the immediately obstructing forces act on the vessels athwart the normal course of their streams and in a manner such as to give to these swellings the circular or gyrating figures they take. These forces can be no other than those engaged in the act of rectal defæcation—viz., intestinal peristalsis with the aid of its co-efficients in that function. But, superadded to these physiological energies, there are clear indications of co-operative and intermediate agency in the form of compact and hardened matter passing through the intestine, and not unfrequently an abnormal state of its mucous surface. Difficult rectal defæcation must be, therefore, the most constant, if not the almost exceptional, cause of hæmorrhoidal dilatations; peristalsis taking, perhaps, the largest direct share.\* The distribution and relative excitability of the excito-, as well as vaso-motor, filaments in the rectal textures are such, that their muscular excitability is intense in direct ratio with proximity to the anal orifice, where varices are found in the greatest abundance, and usually attain

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\* With a little alteration in phraseology, the following passage might supplant the best extant account of the theory of piles :—“ If bile phlegm be determined to the veins of the rectum, it heats the blood in the veins ;



the largest size. Here, too, an excess of reflex action is displayed in the formation of those folds of mucous membrane which encumber that outlet and which, with pile and other appendages, are often liable to become helplessly protruded—occasionally, even, to ano-rectal invagination.

These observations are commonplace enough. My object in making them is to disengage one from the many integrals by which the etiology of “piles” has become trammelled; and to show that not only is there no other that can so well explain its many and often conflicting semeiological elements, but that this will answer the need, and best tally, as well, with their pathological demands. Moreover, they sustain the important practical inference that hæmorrhoidal disease is essentially *local*—subject of course, to the influence of those constitutional disturbances by which all local diseases are prone to become more or less modified.

I must premise what I have to say on the treatment of hæmorrhoidal disease by the remark that the symptoms, together with the means of actual observation in these cases, render their pathology a matter of easy, nay,

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and these veins becoming heated, attract blood from the nearest veins, and, being gorged, the inside of the gut swells outwardly, and the heads of the veins being raised up, and, at the same time, bruised by the fæces passing out and upward by the blood collected in them, they squirt out blood most frequently along with the fæces, but sometimes without.”—*On Hæmorrhoids: Hippocrates* (Adams' Translation).



certain inference. All hæmorrhoidal disorder begins in vein coat dilatation; and, as morbid conditions supervene—from simple congestion affecting the several vessels involved, to more or less acute inflammation of their coats—so, of course, these are attended with such textural and blood changes as such disorders ordinarily give rise to. Others follow; and the disorder, from being acute and transitory, sooner or later becomes chronic and permanent, with such localised morbid results as I have attempted to describe.

It is said that Copernicus died from hæmorrhage through piles; an assertion which, whether it was really so or not, has gone far to brand hæmorrhoidal diseases with a stigma they do not deserve; at all events, they are not more formidable on that account.

But vessels, when thus permanently diseased, do not usually lose their proneness or predisposition to be attacked by various forms of *sthenic* disorder—often those in which they began. Such an attack constitutes the *acute* stage of piles—the form of hæmorrhoidal disease which most often presents itself, and, in which, acute and chronic conditions co-exist. In such cases the clear recognition of the symptoms due to each of these pathological states is of moment; for as the one is in its character variably acute but transitory, and the other is, in the same respect, chronic and permanent, the distinction for *practical* purposes serves an important end. I say for

practical purposes ; for, as a rule, the supervention of acute upon chronic or permanent hæmorrhoidal disease forbids, except under rare circumstances, the employment of the special topical treatment that it requires in the latter form. And as it not unfrequently happens, too, that many of the more painful contingencies of chronic pile disease result from the accession of constitutional disorder, so the remedies that succeed in allaying or suppressing the one will often, at least temporarily, in like manner favourably influence the other. Hence the first notion of the treatment of these diseases resolves itself into *constitutional* or *local* ; yet there are no periods during the adoption of remedies for its special phases that the possibility of affianced complication should be lost sight of.

It is not my design here to treat of, or attempt to instruct as to, the constitutional treatment of hæmorrhoidal disease, especially of those forms which may be said to be acute (these are well understood), beyond saying that local bleeding, where local vascular excitation runs high, by leeches, the complete unloading of the lower bowels, antiphlogistic remedies, and opium are amongst the most useful of the means that can be employed. It has been taught us by Mr. Abernethy, with whose admirable lessons every one is, or ought to be, familiar.

I will turn now to the subject of chronic hæmorrhoidal swellings—such as result from structural changes, not always

amenable to merely constitutional remedies. And of these the variety most common and constantly met with, requiring local or surgical treatment, is that which I have treated of as varix, saccular or erectile—in popular phraseology “piles.” The other varieties—plexiform and hæmorrhoidal varicosity—rarely require other than palliative and simple treatment; but should the involved tissues take courses similar to those incidental to the varicial form, they will admit of being similarly treated.

It is, then, the old and well-known “pile” tumour that requires explicit modes of treatment; and it is usually under hæmorrhagic conditions that such interference is absolutely demanded. The question then arises—What, according to its strict pathology, are the means best suited to command its arrest when bleeding occurs from such a tumour? The *object* is the obliteration of the pile sac, with that of the proximate portions of its afferent and efferent vessels; for there can be no doubt, when rectal hæmorrhage takes place, especially with the objective evidence that each case at the time of its accession invariably supplies, that it proceeds from an *ulcerated* varix or pile, and not from *extravasation* from the general mucous surface of the bowel. Moreover, it may proceed from one pile or several of a cluster coincidently, whilst other piles of the same cluster show no disposition to bleed. Under no circumstances ought a pile that has once bled, or shown a disposition to



bleed, to be allowed, if possible, to bleed again. The *means* simply must be such as are selected for the suppression of hæmorrhage through structural lesion of vein coats in any other parts of the body. Its *immediate* arrest can almost always be secured by raising the trunk and local pressure.

The subject of the surgical treatment of hæmorrhoids was well nigh practically exhausted by Hippocrates, Celsus, Galen, Paulus Ægineta, and their contemporaries,—by whom, indeed, even the latest suggestions were anticipated; so that it is reasonable to assume that these Masters were not unacquainted with, at least, their morbid anatomy. Hippocrates tried to disarm operations on piles of the danger or the pain alleged to belong to them.\* His Armamentum, which the Arabian surgeons adopted, included every modern invention—styptics, cauterisation, excision, crushing, and evulsion; and the rules for these several modes of procedure, as well as the especial medicaments themselves, are so excellent that I shall venture to premise my concluding remarks with excerpts from his works. “First of all,” says Hippocrates, “it should be known in what sort of a place they—hæmorrhoids—are formed.” Moreover, the older the pile or “condyloma,”

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\* “Such operations as those of cutting, sewing, binding, and applying septics to the anus, although formidable in name, are by no means so much so in reality as might be suspected.”—*Op. id.*, vol. i., p. 825.



the easier the cure. If the pile be high up in the rectum, it must be examined by means of a speculum, then smeared with black aconite, and washed with dry wine for the next three days. It will then perish and fall off, or may easily be removed without loss of blood. The surgeon is cautioned that he must not be deceived in using the speculum, for, when expanded, it renders the pile level with the surrounding parts; but when contracted it shows the tumour again. Excision is to be performed after fomentation with hot water, and should be followed by a styptic. Celsus endorses the plan by excision of his great predecessor. "*Alvus ante omnia docetur, tum vulsella tuberculum apprehensum juxta radices exciditur.*" Or the pile might be taken away with the finger, *i.e.*, by evulsion;\* and in that case, too, it must be removed "by the roots," when there will be no risk of bleeding. If it be separated elsewhere a dangerous bleeding might follow. "If the legs or arms," adds Hippocrates (*and not without good reason*), "be cut off at the joints, there will be no flow of blood; but if they are cut off above or below, hollow veins will be found there which will bleed, and there will be difficulty in stopping the bleeding." So if the piles are taken off at points of

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\* This plan is specially recommended for the vascular outgrowths that have been referred to as "erectile varices"—the "bleeding condylomata" of Celsus. "There is no more difficulty in this than in skinning a sheep, and it should be done without the patient's knowledge, whilst he is engaged in conversation. If he cries out, so much the better."—Hip., *Op. id.*

junction with the veins there will be no bleeding, although the veins above and below will pour forth blood if wounded.

For cauterisation of external piles the great Master advised the actual cautery—much the same as that of modern use, but with a coin-shaped *disc*, in preference to one with a *globular* or button point. The plan is this:—"Having, on the preceding day, purged the patient with medicine, place him, as for excision, on his back with a pillow under his breech, force out the anus as much as possible with the finger, and apply the iron *red hot*. Burn the pile until it be dried up; and no pile should be left unburnt. The piles themselves are easily recognised, "for they project on the inside of the gut like black grapes, and when the anus is forced out they spirt blood." (The cautery and canula are figured in Scultetus.) In applying this agency to piles higher up, Hippocrates modifies it by reducing the *burning* to *singeing*. A wooden canula is to be prepared with an iron that exactly fits it. After the introduction of the tube, "the iron, heated red-hot, is to be pressed down it and frequently withdrawn, so that the part might have the heat without its being followed by a sore; and the dried veins will heal up."

If you are not disposed to use either the cautery, evulsion, or excision, a styptic composed of myrrh, galls and alum, with melanteria—the ferruginous arseniate of copper (see Paulus

Ægineta, vol. 3, p. 244, Syd. Soc. edit.)—used in a dry state, will, it is said, cause the hæmorrhoid to separate “like a piece of burnt hide;” or they may be removed by a succession of suppositories compounded of “sepia powder, plumbago, bitumen, alum, flos æris, galls, verdegris, and boiled oil.” All operations on piles require free purging of the patient on the day preceding.

These instructions are not only admirable, but almost all-sufficient. They recognise the true nature of the disease, and suggest all that is positively needed for their topical treatment. I shall add but little to them; but call attention to the important fact that in operations about the rectum, especially the anal portion, tetanus and pyæmia should always be kept in mind as being the most fruitful sources of contingent danger—perils which are favoured, *I* believe, by bad health and nerve *crushing* or tearing. The ecraseur of Chassaignac and such like instruments yield, therefore, in point of selection, to *sharp cutting instruments* in this region.

But excision and, indeed, the ligature have been, in the hands of the greatest surgeons—Sir A. Cooper, Copeland,\* Bushe, Kerby and, doubtless, others—proved fatal through hæmorrhage. Has not this been due to the extensive

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\* Mr. Copeland's experience of ligature was not assuring, but in Sir James Earle's hands it proved very successful. These experiences have ceased to be of any moment in practical surgery. (Pott's Works, by Earle.)



wounds often supposed to be necessary by the *apparent* extent of the hæmorrhoidal textures, and to the vascular activity thus provoked? To obviate such results, Mr. Smith's plan of cauterising the clamped and raw surfaces is an excellent device.

The comparative absence, too, of septic conditions in modern, and especially rectal, surgery (in which they cannot be too scrupulously avoided) is, doubtless, due to the valuable lessons in the treatment of wounds that have been taught us by our eminent surgeon and justly distinguished countryman, Professor Lister.

The actual stoppage of bleeding, in cases of varicidal hæmorrhoids, is, I think, best accomplished by bringing every point that bleeds under the influence of some efficient styptic or mechanical contrivance; and as to the means and appliances, it is not of so much importance which should be selected out of the many that are recommended, as that the one used shall, in the particular case, secure the end in view. Amongst styptics, the Vienna paste, nitric acid, and the perchloride of iron are those most generally employed. The latter, in the form of the strong tincture, is, perhaps, the most trustworthy, if freely applied to an ulcerated pile; whilst cauterisation is safe, and can best be applied either by means of a good sized needle, rendered candent by the benzine vapour method, or by the ordinary cautery, with or without

Mr. Smith's clamp. Mr. Pollock's proposal to crush these tumours is feasible, but I question whether it has any positive advantage over the other methods suggested.

On the whole, however, I have preferred the ligature, which can be easily applied to the parts requiring it; and, with such limitation, as to include either the summit of the bleeding orifice, or, *what is generally preferable*, the whole pile.

The hæmorrhagic points, always recognisable by a dull reddish areole or by the bleeding, can, for this purpose, be severally and easily picked up by the common arterial, or, if necessary, a larger and blunt-beaked, forceps. Thus the remedy is limited to the pile or piles actually engaged in pouring out the blood, and all reasonable chance of further hæmorrhage from the same sources is precluded, without any offence given to unoffending parts. The process is very simple, for there is no difficulty (whilst the patient is in a state of anæsthesia) in so everting every portion of the rectum in which bleeding from this source is likely to occur, that each and every point can be brought under observation as well as treatment. Moreover, the method is, or might be, absolutely bloodless, or nearly so, for it is only required to snip any portion of skin or mucous membrane that might impede the close application of the ligature to the pile tissues; and repair is unattended with the protracted suffering which it

is the fate of patients, under more heroic treatment, to endure. The circumjacent inflammatory action thus set up might extend itself so far as to bring about the consolidation of other pile-affected veins; but if not, and other piles should, in their turn, ulcerate and bleed, the treatment is not so formidable or a matter of such moment as to constitute any great objection to its repetition. *This* continually happens after major operations.

But there is one other consideration which I venture to suggest, and upon which, from my own experience, I have arrived at a satisfactory conclusion; and it is this—that the modern practices preliminary to pile operations are not necessary. I refer, more especially, to the advised habit of “bringing down the piles,” by exciting peristalsis to its full extent by means of local irritation and forcing, in order that they might be more thoroughly and easily manipulated. Although this custom was enjoined in the Greek, Roman, and Arabian schools, it is not only, I think, objectionable in a scientific point of view, but calculated, in place of furthering the objects designed, rather to embarrass the operator in prosecuting them.

There are few cases of old rectal hæmorrhoids in which lower portions of the mucous and submucous tissues do not readily form themselves into more or less extensive folds, which protrude on being even moderately irritated. These folds should always be carefully dis-



tinguished from the actual pile structures, for they are apt to become very vascular and, when near the anal verge, the seats of fissure, excoriation, and ulceration; so that, extruded under such conditions, and by such means, there is at times a difficulty in distinguishing between the real, and the mock, disorder. Thus portions of tissue, which, thus circumstanced, bleed freely, are, I believe, frequently cut away, and in great profusion: and needlessly, since these folds are easily rectified by the removal of a few small vertical segments by the scissors.

The treatment preliminary to operations should be such as will place the patient in a good state of health, and the parts in the utmost state of possible quiet. It should therefore include a free cleansing of the lower intestine; whilst an opiate suppository, before and afterwards, is usually all that is required, and often not even this.

I may just add that the dermal folds which so often make their appearance at, and around, the verge of the anus, and assume the form of thick, warty, or pendulous growths or condylomata, are in nowise necessarily associated with piles; and, when inconvenient, might be removed by any of the several modes recommended for piles. The knife or scissors is, perhaps, the best remedy.

## APPENDIX.

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I.

"With regard to the development of the renal system, observations made upon the embryos of birds and some amphibious animals have taught us," says Ludovic Jacobson, of Copenhagen, "that it begins in connection with the omphalo-mesenteric veins; for it is probable that in this system it begins first of all to exercise its functions." The Professor continues that "as, in the mollusca, its veins are distributed upon the *calcareous sac*, and the fluid secreted by this organ in the gasteropoda contains a large quantity of uric acid, so that organ is analogous to the kidneys of the vertebrata."

In 1817, Bojanus, according to Oken,\* first gave special attention to the portal system. A very few years later (about 1820) Jacobson followed up the subject "with diligence and by means of correct anatomical researches,

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\* "Isis."

and *many experiments instituted in living animals.*" The results were communicated to the Philomathic Society of Paris, and to the Royal Society of Sciences of Copenhagen, and subsequently incorporated in a paper which was published in the number of the *Edinburgh Medical and Surgical Journal* for January, 1823.

According to this learned Professor, the venous system undergoes three "modifications" in birds, reptiles, and fishes. In the *first*, the veins from the middle or posterior part of the body go immediately *through* the kidneys, or the kidneys and liver; whilst a caudal vein which receives those from the kidneys and testicles, or ovaries, forms the inferior vena cava.

In the *second*, the caudal veins, which bring the blood from the skin and muscles of the posterior part of the body, divide into two branches, which, after receiving some veins from the middle part of the body, flow to the kidneys of each side, and after distributing their branches to the parenchymatous substance of these glands, go on to form the cava.

In the *third* modification the veins, returning the blood from the same parts, convey it in part to the kidneys and in part to the liver, whilst from these organs veins proceed to form the cava.

In a paper on the "Significance and Ends of the Portal System," communicated to the *London and Edinburgh Monthly Journal of Medical Science*, in September, 1841, Dr. Robert Willis contends that the "portal system is a



contrivance for economising arterial blood; and that its blood is no more qualified for furnishing bile than other blood; for in cases in which a distinct portal system is wanting, the bile is secreted as usual: . . . so that it is not an arrangement indispensable to the preservation of the individual, for individuals live and thrive without it." In fishes and reptiles there is a portal system of the kidneys, as well as of the liver. In the former, the blood from the tail and, frequently, from the ovaries, testes, and swimming-bladder, is conveyed into the cava, but not until it has undergone distribution from stems to branches and capillaries in those organs, as the blood of the vena porta is distributed to the liver in quadrupeds and man.

Professor Huxley says, "In birds the sinus venosus is not distinct from the right auricle, and there are two anterior venæ cavæ. The vena cava inferior arises as in mammals by the union of the two common iliacs. It receives both the right and left hepatic veins, and, in addition, the anterior abdominal vein, *which no longer enters the portal system*; passes up the anterior wall of the abdomen, and through the hepatic fissure to join the inferior cava. . . . In mammalia the efferent veins of the kidneys open directly into the trunk of the inferior cava, *and the portal vein is composed exclusively of radicles proceeding from the dry chyloporetic viscera*. . . . The veins of the wings of bats possess a rhythmical contractility, which,

in combination with the disposition of their valves, assists the circulation of the blood " ("Anatomy of Vertebrate Mammalia").\*

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## II.

I have quoted a passage from one of our best anatomical text books (note, p. 35) on portal inosculation. The particulars might express the most constant and, indeed, the *normal* arrangement and distribution of the veins that constitute the portal system; but further observation is needed in order to arrive at a satisfactory conclusion as to that which, out of the many reputed varieties, should be accepted as the typical arrangement. Veins are, more than arteries, prone to abnormalities of all kinds—congenital (*i.e.*, teleiological), and pathological; and of these, divergences from the typical plan of *inosculation* are, perhaps, the most common. On apparently slight emergency, communications will open, as in the case of bowel perforations, between veins that naturally convey dissimilar products,

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\* This passage had not been seen by me when I alluded to the adventitious aid given to the vein circulation in certain organs and parts; nor had I seen the last important statement until my remarks, as to portal injection, had passed through the press.

and thus give rise to results, associated with strange semeiological phenomena that prove as hard of interpretation as of control. Such abnormalities have existed; although little has been done with them, beyond their record; and precious, indeed, will this prove, if it but lead to fresh research in the field of vein abnormality.

At the beginning of this century Dr. Gurlt, of the University of Vratislaw, published a valuable Memoir, "*De Venarum Deformatibus*," which contains much interesting matter. Amongst his collected instances is one which is admirably illustrative of the importance attached to their study.\* A man, æt. forty, had a large umbilical swelling with dropsy. He was brought into the theatre of the University, when Gurlt suggested that the umbilical vein had not closed. Haller had collected six such cases, occurring in persons between the ages of seven and thirty-five, and found in all patency of the umbilical vein. The patient under Gurlt's observation made a temporary recovery, venesection—the panacea of the period—having been strictly forbidden. He, however, died, apparently, of some other malady, when the diagnosis was confirmed by autopsy.

In further elucidation of this subject, I will select a few instances from the memoir alluded to and other sources

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\* Anat. Pract. Rational, Cent. 1., dos. 96, p. 187. (Blancard.)



The azygoids have been wanting, and their place supplied by intercostals (Wistar).\*

Both azygoid trunks have been superseded by irregular branches, intercommunicating with the inferior cava (Otto). †

Abernethy‡ mentions a case of a well-nourished infant, in whom the portal vein entered the inferior cava distinct from any other, and not far below the renal; and Huber § notes another in which the portal pierced the diaphragm and joined the thoracic inferior cava. ||

The superior cava has been supplanted by the umbilical, as well as by other veins; ¶ and, in cases of *single* kidney, the renal veins are said to have been found wanting, but it is not stated how their places were made good. \*\*

Morgagni mentions a case of a supplemental cava, which received the iliac and the emulgent vein, †† also an instance of obliteration of the left iliac, and its replacement by "two or three small veins;" ‡‡ and another in which the subclavian was duplex on both sides,—on the right the veins were of equal size, but on the left the duplication was for a much shorter distance than on the other side, and the additional vein "much more slender." §§

\* "System of Anatomy for the use of Students." Philadelphia, 1814.

† Gurlt. Op. Cit. ‡ "Surgical and Physiological Essays." Lond., 1793.

§ Observationes Anatomicae. || Littré.

¶ Munro. \*\* Winslow and Valsalva.

†† Morgagni, Let. 47, art. 30. ‡‡ *Ib.* Let. 48, art. 34.

§§ *Ib.* Let. 69, art. 3.

Gurlt collected other cases of abnormality in which there was comparatively an excess of vein appliance. As many as seven pulmonary veins have been met with; in one instance two *superior cavæ*, and in a third, as reported by Theune,\* as many as three. The left jugular and subclavian, with their contributories, have been found disconnected with the cava, their void having been filled by the common jugulars, of which, one joined the right auricle, whilst the other—the right—reached the left at a short distance from the point of junction of the inferior cava. Meckel saw two such abnormalities; whilst Niemayer gives an instance in which the left jugular vein reached the inferior cava in such a manner as though it formed a supplemental superior cava. A memorable example of the same kind, the details of which are of great interest, is related by Murray.† In another case of duplex superior cava, the left of the two veins (derived from the common jugular and subclavian) joined the right auricle by separate channels.‡ In a girl a year old, with congenital mort. cœrul., two superior cavæ were found; of which, one reached the right auricle, whilst the other reached the left, in company with the inferior cavæ

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\* "*De confluz trium cavarum in cordatrio extra.*" Halæ, 1763.

† Neue Schwed Abhandlung. Bd. 2, p. 286.

‡ Weese, *De Cordis Ectopia.* Berol, 1819. c. fig.

(Farre).\* Other like irregularities, implicating the cavæ and the pulmonary veins, have been recorded by Buettero.†

The jugulars, subclavian, vertebral, azygoid, and, indeed, almost all considerable veins, are sometimes duplex; whilst the renal has been known to be quadrupled, according to Haller and Bartholinus. In these cases some veins take the ordinary course, whilst others go direct to the cava.

Of the spermatic veins, when numerically in excess, some go to the renal, others to the cava. Haller says the exception to duplication lies with the iliacs. Two coronary, with a like number of pulmonary, veins have been found to enter the left auricle in conjunction. This was observed in a woman who reached the age of thirty.‡ I might continue these excerpts, but enough has been said to show how wide a range vein abnormality has been known to take, and to invite further research as to the causes and effects of the special forms it assumes. It is clear that such "deformities" might be either teleiological or pathological; and it is not improbable that they, and others of a kindred nature, might be called into even temporary existence on special and pressing emergencies.

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\* "Malformation of the Human Heart." 1814. See also Dr. Peacock's valuable work on "Malformation of the Heart" (second edition); and specimens contributed to the museum of the Royal College of Surgeons.

† Anat. Königsberg, 1745. ‡ "Collect. Meckel."





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